

29. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer,

wherein the control field in the packet includes a packet header.

30. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer,

wherein the multi-layer network protocol comprises TCP/IP, and the control field comprises a TCP/IP header.

31. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer,

including prior to receiving the packet, allocating the target buffer for the plurality of packets, and notifying the network interface of the allocated target buffer.

32. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer,

the network interface is coupled to a network medium supporting a maximum packet size, and including transmitting a request from an application for transfer of a block of data from the data source, the block of

data having a length potentially greater than the maximum packet size for the medium.

33. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer, the network interface is coupled to a network medium supporting a maximum packet size, and including transmitting a request from an application for transfer of a block of data from the data source, the block of data having a length potentially greater than the maximum packet size for the medium,

including notifying the network interface in response to the request of a flow specification for the block of data according to the multi-layer network protocol, and wherein the step of receiving the packet includes identifying packet using the flow specification.

34. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer, the network interface is coupled to a network medium supporting a maximum packet size, and including transmitting a request from an application for transfer of a block of data from the data source, the block of data having a length potentially greater than the maximum packet size for the medium,

including notifying the network interface in response to the request of a flow specification for the block of data according to the multi-layer network protocol, and wherein the step of receiving the packet includes identifying packet using the flow specification,

wherein the network protocol comprises TCP/IP, and the flow specification includes a sequence number of a first byte from the plurality of packets to be stored in the target buffer.

35. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the

data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer,

wherein the flow specification includes a sequence number for the block of data.

36. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a flow specification, and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer,

wherein the flow specification includes a sequence number for the block of data, and the flow specification includes IP source and destination addresses and TCP port numbers.

37. (New) The method of claim 28, wherein control of the flow specification is transferred from the network interface so that a second packet that matches the flow specification is processed by the network layer.

38. (New) The method of claim 28, wherein determining based on the control field in the network interface whether the packet matches a flow specification is performed by specialized network processing hardware.

39. (New) The method of claim 28, wherein the target buffer is assigned by processing an initial packet with the process.

40. (New) The method of claim 28, wherein the network interface comprises means for determining whether the packet matches the flow specification.

41. (New) A method for transferring data on a network from a data source to an end station executing a multi-layer network protocol, including a network layer and at least one higher layer, through a network interface on the end station, comprising:

receiving in the network interface a packet which carries a data payload from a block of data in the data source, and a control field identifying the packet;

determining based on the control field in the network interface whether the packet matches a transmit control block (TCB), and if so transferring the data payload in the packet directly to a target buffer assigned by a process at a layer higher than the network layer.

42. (New) The method of claim 41, wherein the control field in the packet includes a packet header.

43. (New) The method of claim 41, wherein the multi-layer network protocol comprises TCP/IP, and the control field comprises a TCP/IP header.

44. (New) The method of claim 41, including prior to receiving the packet, allocating the target buffer for a plurality of packets, and notifying the network interface of the allocated target buffer.

45. (New) The method of claim 41, wherein the network interface is coupled to a network medium supporting a maximum packet size, and including transmitting a request from an application for transfer of a block of data from the data source, the block of data having a length potentially greater than the maximum packet size for the medium.

46. (New) The method of claim 45, including notifying the network interface in response to the request of a TCB for the block of data according to the multi-layer network protocol, and wherein the step of receiving the packet includes identifying packet using the TCB.

47. (New) The method of claim 46, wherein the network protocol comprises TCP/IP, and the TCB includes a sequence number of a first byte from the plurality of packets to be stored in the target buffer.

48. (New) The method of claim 41, wherein the TCB includes a sequence number for the block of data.

49. (New) The method of claim 48, wherein the TCB includes IP source and destination addresses and TCP port numbers.

50. (New) The method of claim 41, wherein control of the TCB is transferred from the network interface so that a second packet that matches the TCB is processed by the network layer.

51. (New) The method of claim 41, wherein determining based on the control field in the network interface whether the packet matches the TCB is performed by an application specific integrated circuit (ASIC).

52. (New) The method of claim 41, wherein the target buffer is assigned by processing an initial packet with the process.

53. (New) The method of claim 41, wherein the target buffer is identified with a memory descriptor list (MDL).

54. (New) A method for transferring data on a network from a data source to an end station, the end station comprising a host portion and a network interface portion, the host portion executing a multi-layer network protocol including a network layer and at least one higher layer, the data being transferred through the network interface portion of the end station, comprising:

transferring from the host portion to the network interface portion a connection definition, the connection definition comprising an IP source address, an IP destination address, a TCP source port and a TCP destination port;

receiving onto the network interface portion a first packet of a multi-packet message, the multi-packet message being a message of a layer higher than the network layer, the first packet including a control field identifying the first packet, the multi-packet message having a data payload;

reading onto the network interface portion a command from a command buffer, the command including an identifier of a target buffer, the target buffer having been assigned on the host portion by a process at a layer higher than the network layer;

determining based on the control field in the network interface portion whether the first packet corresponds to the connection definition,



and if so transferring the data payload of the multi-packet message from the network interface portion directly to the target buffer; and

the network interface portion writing to a response buffer and thereby indicating to the host portion completion of the command.

55. (New) The method of Claim 50, wherein the network interface portion writes status information and a command buffer identifier into the response buffer.

56. (New) The method of Claim 50, wherein the identifier of the target buffer is a list of addresses.

57. (New) The method of Claim 50, wherein the identifier of the target buffer is a list of data pointers.

58. (New) The method of Claim 50, wherein the connection definition is a part of a Transmit Control Block (TCB).

59. (New) The method of Claim 50, wherein the data payload is transferred to the host portion after the headers of the packets of the multi-packet message have been stripped.

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REMARKS

Applicants hereby seek to have an interference declared between the present application (09/692,561) and U.S. Patent No. 6,246,683, issued June 12, 2001.

U.S. Patent No. 6,246,683 (Connery, et al.), issued from U.S. application serial number 09/071,692 (filed May 1, 1998).